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An Assessment of Technology Transfer System in Afghanistan: The Case of Balkh and Nangarhar provinces

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Abstract

An estimated 85% of Afghanistan's population lives in rural areas, most of which are resource poor farmers whose livelihoods depend on agriculture and livestock in agro-pastoral or crop-livestock systems. Agriculture – including the processing of agricultural and livestock products -- provide employment to a bulk of the labor force. Thus, Afghanistan's economy is based mainly on agriculture and livestock production. Wheat provides the bulk of calorie intake, and accounts for about 70% of the area devoted to cereals and 75% of food grain production. According to the National Agricultural Master Plan of Afghanistan, achieving food security is one of the top priorities of the Ministry of Agriculture, Irrigation and Livestock (MAIL). However, average yields of food and forage crops and livestock productivity are far lower in Afghanistan than their potential. Addressing the problems of Afghanistan's agriculture requires an integrated and multi-disciplinary approach.

Key words: Afghanistan, Technology Transfer, Balkh, Nangarhar

These problems are further compounded because of the limited human resource base of Afghan agricultural institutions, and their limited capacity due to unavailability of up-to-date information; lack of training opportunities and resources to adopt and disseminate new agricultural technologies. Linkages of extension with research are poor, which is due to lack of qualified staff in the research establishment in two states. NGO and private sector has been playing a greater role in organizing the farmers into producer companies. Water emerged as the most critical issue for developing agriculture in Afghanistan (av. Rainfall 400mm/yr, last year 100mm only)), in both Balkh and Nangarhar provinces despite having some good sources of water were facing acute shortages, when it was needed most. Availability of reservoirs is limited and sedimentation is further limiting capacity. Soil's pH typically ranges between 8-8.5 and they are low in Phosphorus but calcium is abundant. Suggestions for improvement include improved water harvesting techniques at the farm level, check dams and vegetation cover and/or grazing control to protect check dams. Bank protection along rivers and canals and more emphasis on water tolerant plants such as pistachio and walnut is also needed urgently. There is a need for a national solidarity program focusing on social development.

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Introduction:

An estimated 85% of Afghanistan's population lives in rural areas, most of which are resource poor farmers whose livelihoods depend on agriculture and livestock in agro-pastoral or crop-livestock systems. Agriculture – including the processing of agricultural and livestock products -- provide employment to a bulk of the labor force. Thus, Afghanistan's economy is based mainly on agriculture and livestock production. Wheat provides the bulk of calorie intake, and accounts for about 70% of the area devoted to cereals and 75% of food grain production. During 2007-08, wheat covered more than 2.2 million hectares of the agricultural land. Rice, the next important cereal crop, is planted on about 210,000 ha. Barley and maize, along with other forage crops, are primarily grown as feed crops. Some 6% of the irrigated area is used to grow vegetables, both for domestic consumption and as export crops. Potato occupies some 90% of the area planted to vegetables and is another important staple food crop for the population. Onion, tomato and okra are the other major vegetable crops grown, throughout most of the country. Agricultural productivity in Afghanistan has declined markedly as a result of the prolonged conflict, which has damaged the agricultural infrastructure and considerably reduced the area under effective irrigation. The prolonged drought (1999-2004), also resulted in total failure of rainfed cropping, and reduced the water available for irrigated agriculture.

Livestock rearing provides opportunities for improved human nutrition through meat and milk products, income, asset building, and employment for poor farmers. In addition, livestock production provides raw materials for agro-industries, and contributes to crop production through provision of draft animal power for land preparation and the use of manure for soil fertility and power for land preparation. Past and projected trends in production and consumption of livestock products in Afghanistan and other developing countries point to enormous opportunities for dairy sector growth with extendable benefits to smallholder livestock producers, especially women who are responsible for milk processing and marketing. Dairying enables smallholder livestock producer access into high-value agricultural markets to generate income and improve food security; however, lack of access to appropriate technologies (e.g. feeds and feeding systems, milk processing) have hindered the development of the smallholder dairy enterprise in Afghanistan.

According to the National Agricultural Master Plan of Afghanistan, achieving food security is one of the top priorities of the Ministry of Agriculture, Irrigation and Livestock (MAIL). However, average yields of food and forage crops and livestock productivity are far lower in Afghanistan than their potential. Average yield of irrigated wheat in farmers' field is still around 2 tons/ha as compared with the regional potential of 4-5 tons/ha. Owing to recent drought, wheat yield is expected to go further down to less than 1.0 mt/ ha³. As a result, Afghanistan imports about 400,000 – 1,000,000 tons of wheat every year. Average yields of other staple crops like rice and potato are also 40-50% less than their potential. Other food and forage crops and vegetables also produce far below potential yields. Such low yields do not supply a sufficient quantity of food required by Afghanistan's rapidly growing population, augmented by returning refugees. As per the 2005 National Risk and Vulnerability Assessment some 6.6 million Afghans

do not meet their minimum food requirements². According to the FAO, food prices, particularly for wheat and wheat flour, have increased by 60-80% across Afghanistan during the past few months. This has pushed at least 2.55 million people into high-risk food insecurity³.

Addressing the problems of Afghanistan's agriculture requires an integrated and multi-disciplinary approach because it is under serious threat due to:

1. Unavailability of quality seeds of improved high yielding crop and forage varieties,
2. Lack of knowledge about best practices to obtain optimum yields;
3. Continued deterioration of soil health;
4. Exhaustion of natural resources and damage to environment due to non-judicious use of resources and inputs;
5. Low on-farm water use efficiency, which among other reasons is often, associated with inappropriate tillage practices.

These problems are further compounded because of the limited human resource base of Afghan agricultural institutions, and their limited capacity due to unavailability of up-to-date information; lack of training opportunities and resources to adopt and disseminate new agricultural technologies.

Thus, there is substantial need to

1. Develop improved technologies through adaptive research that will maintain crop-livestock yields even under less favorable conditions,
2. Promote the transfer of technologies to obtain optimum benefits from improved food/forage and livestock systems, and
3. Develop the capacity of the researchers and extension workers of MAIL, members of agriculture faculties of universities, NGO staff, other developmental agencies, and farmers.

Institutions Visited

The visit to assess the technology transfer situation in Afghanistan resulted in meetings with key stakeholders. These visits included the Extension and Research (E-R) Officers of MAIL in Kabul, as well as the E-R officers in Balkh (Mazar-e-Sharif) and Nangarhar (Jalalabad) provinces. In addition, meetings were held with various NGOs working in this country, including Mercy Corp, Catholic Relief Services (CRS), the Drukshaan Agricultural and Social Association, Chemonics, JDA (spell out) and DIA(spell out), and ASAP (spell out) officials. Also, meetings were held with the Deans of Faculties of Agriculture at universities in Kabul, Balkh and Nangarhar Provinces. This provided an opportunity to get their assessment and feedback on the state of agricultural development

² http://www.wfp.org/country_brief/indexcountry.asp?country=004

³ <http://www.irinnews.org/Report.aspx?ReportId=76400>

³ <http://www.pecad.fas.usda.gov/highlights/2008/08/Afghanistan%20Drought/>

in the country, including the institutional constraints being faced and possible solutions thereof. In addition, various private sector firms that are involved in input supply and technology transfer to various groups of farmers were also contacted to get their assessment about how to improve technology transfer within the country and how to usher in a more market-driven extension system in Afghanistan. The ATMA model and its application in India were also shared with these different groups.

All the stakeholders were asked to suggest ways and means to reform the institutions serving the Afghan agricultural sector and they were presented with the case study of ATMA model in India to solicit their views on its potential applicability in Afghanistan. It was the general opinion that though the model was very good, it has to be modified to suit Afghan conditions. It was suggested that due to severe shortage of operating resources, agricultural infrastructure and qualified manpower, the implementation of market-led demand driven extension had a scope, but this should be done along with addressing other core issues, as mentioned above, to make any significant impact in improving rural livelihoods through a more market-driven agricultural sector.

▪ **Overview of the MAIL and its departments**

The MAIL has Directorates of Agriculture in all 38 provinces of the country and these Directorates are manned by Director Generals of Agriculture. Under the DG of Agriculture there are departmental heads called Directors for Agriculture, Veterinary, Mechanization, Land records, Extension, Forestry, Cooperatives, Plant Protection, and Irrigation. At the district level the same set-up exists with the designation being Supervisors or District Officers. As such for extension work there is no exclusive infrastructure or staff available at sub-district levels. Some NGOs, private sector companies and international agencies who are working at the grass root level have their own staff and the Directorate works in close cooperation with these agencies by extending them all the facilities it can for transferring the technology to the farmers. This has resulted in development of some farmer's organizations, cooperatives etc. at different provinces. Though the mandate of Directorate of Agriculture, MAIL is very comprehensive-

1. Ensuring food national security
2. Developing and rehabilitating orchards
3. Livestock improvement and development
4. Management of natural resources
5. Development and rehabilitation of irrigation system
6. Development of agricultural markets and infrastructure
7. Capacity building of the farmers and officers

It was not in a position to implement it on the ground due to various constraints mentioned discussed in following sections. The Director ARIA (Agricultural Research Institute of Afghanistan) lamented that though there was a Master Plan available, which was developed keeping requirements, needs and ground realities of Afghanistan in mind, no one was actually following that plan; agencies were just doing what they deemed important.

▪ **Assessment of Research Institutions**

Agricultural Research

In meeting with Agricultural Research Institute of Afghanistan (ARIA), MAIL in Kabul, it was indicated that the most qualified and competent personnel are all working for NGOs and international organizations. Further, MAIL has to make do with the older, more poorly trained staff. Also, the research activities of the department are primarily focused on adaptive research and no basic research is being carried out at the present time.

The research department has one Ph.D, 20-25 MSc degree holders within the research department and it currently runs 13 research stations in 18 provinces. The director indicated that the constraints faced by the department include, lack of water (av. Rainfall 400mm/yr, last year 100mm only) and that almost half of the country's land is under plantations and rainfed. There is little or no mechanization, most farms are very small (average land holdings are less than 0.5 ha or about 1 acre) and these fragmented lands are not suitable for mechanization. Also, the on-going civil war has crippled the country's research and extension system, testing labs have yet to be established and agro chemicals and other production inputs are of poor quality. Finally, credit facilities for farmers are a problem, as banks have been unable to recover past loan to farmers and they are unwilling to lend any further funds until the repayment issue has been solved. Also, prices of critical inputs like fertilizers continue to be very high due to high import costs; therefore, farmers still use old, out of date technologies, including water efficient technologies due to the cost factor.

▪ **Dehdadi Research Station, Balkh (MAIL)**

A visit to Dehdadi Research Station, Balkh where Perennial Horticulture Development Project (PHDP) is being implemented, the other six sites where this project is being run are Herat, Jalalabad, Kandhar and three other states. The nursery at this station multiplies almond, apricot, peach and pomegranate seedlings for sale to farmers. Also, the station works on the propagation, selection and documentation of local races of these high-value crops (HVCs). It also works with Nursery Associations and National Grower Association on partnership basis to take good quality planting material to other parts of the country. It gets support from donors in form of germplasm and financial support to run its programme. This is a 3 year project started in March 2007. This is one of the regional fruit tree variety collections. Species in the collection include apple, plum, peach, pomegranate, fig, almond and apricot. They would be willing to cooperate if approached through MAIL. They reported that there was a problem with almond sapling survival and decried the lack of lab support from Kabul in helping identify this disease. This facility gets as much water as it needs being a government facility.

▪ **Sheeshambagh Research Station, Jalalabad, Nangarhar (MAIL)**

This station houses both a seed testing laboratory and a soil testing laboratory and also has most of the modern agricultural equipment needed for research. These labs and most of their equipment comes from FAO and ICARDA; also, these institutions have helped set up a good research system at this station. Varietal trials on mung bean, rice, mint, were being done in the research plots of this station, and irrigation infrastructure was well laid out. There were some citrus plantations also which were planted during Russian

occupation and were now in fruit stage. The seed testing and soil testing labs were catering the needs of farmers of 5-6 states. The local seed grower association also got its seeds tested here before marketing it through their Nangarhar Seeds Company.

▪ **Assessment of Extension Institutions**

Technology Transfer at Balkh Province

During a meeting with Director General of Agriculture, Balkh province, he informed about the severe shortage of manpower which was down from 1430 (pre-war) to 342 at present, seriously hampering the departmental activities in Balkh province. He mentioned need for longer term credit options for farmers, i.e. more than the 1 year loans available presently. Mentioned that farmers are cautious in adapting new technology but they are open to change. An example he provided is the orange glow melons from the US. Farmers initially thought it couldn't be good because it looked funny but took seeds and planted some when they tasted it. By second year, they were selling all they produced. Typically farmers are growing 30 year old varieties of watermelons. Some potential new crops include safflower on semi-irrigated lands and canola on irrigated lands.

The Director General of Agriculture Balkh emphasized need for technical expertise to be provided by an irrigation or water specialist, which is presently lacking. He also said that lab facilities are lacking for insect and disease identification, but that human capacity is adequate. The ministry appears to feel threatened by the more recently educated and better equipped individuals who have been hired and supported by NGOs; they are increasingly viewed as a threat to the MAIL at his level. When asked about government action on water usage he said it is natural that people who are closer to water will use more water. Also, there were donated tractors and implements in his compound that originated from Belarus.

Technology Transfer at Nangarhar Province

The Deputy Director General of Agriculture, Nangarhar province mentioned constraints which included: the lack of water availability and poor irrigation infrastructure; lack of certified seeds, fertilizers and other quality inputs; lack of transport infrastructure; the spread of diseases and insect pests, the lack of a marketing infrastructure and the severe shortage of office space and infrastructure. Besides these problems he cited the lack of in-service training for the officers and for farmers on good agricultural practices. He put the most emphasis on the developing the institutional infrastructure for the extension system, including transportation. During the presentation on market driven extension system he was in total agreement with the concept and said that such approach would help the farmers in organizing themselves in a group and getting better access to the markets. He cited the example of Nangarhar Seed Growers Association which was doing very well, by bringing the farmers closer to the markets. He informed that several other associations were also being organized e.g. Beekeeping Association

Other problems he identified were a lack of water, otherwise they would grow poppies. Also mentioned need for more fertilizer, loans and the lack of a market. He mentioned poultry production as a possible diversification option and told about a farm with 23,000 birds most is imported from Pakistan being run on profitable basis. He mentioned that vegetable storage and processing was a major constraint.

- **Assessment of the current technology transfer strategy and constraints at the provincial and district levels**

Technology Transfer methods used

MAIL uses trainings, demonstration, leaflets, radio and TV programmes to popularize new technology and water saving methods among the farmers, however, the rate of success has been limited. Capacity building of the farmers and officers is a big challenge before the MAIL, and there has been an exodus of officers from MAIL to International NGOs, as they pay better and corner most of the bright professionals available in the country.

MAIL is working with international organizations like FAO, ICARDA, CYMMIT, IRRI, ICRISAT, for bringing new technology in the country like drought resistant wheat and other crops. There are plans to set up a new Afghanistan Agricultural University, with help from Govt. of India and an agreement has been signed between the two governments.

Linkages of extension with research are poor, which is due to lack of qualified staff in the research establishment, which is primarily the responsibility of MAIL, and in two states where I visited the number of staff members had come down significantly e.g. from 1460 (pre-war) to 342 (present) in Balkh province and from 750 (pre-war) to 250 (present) in Nangarhar province. This has to be understood that both research and technology transfer are the primary responsibility of MAIL, and with current shortages of manpower, both TT and research have suffered immensely over the years in Afghanistan.

- **Overall assessment of institutional capacity and constraints within the MAIL**

MAIL faced problems of operational funds as; it is just been able to pay the salaries of their employees, and no more. It offers little input support to its farmers (except what it gets from donors, which it helps in distributing to a select few). There is hardly any provision of In-service training and capacity building of the extension staff at lower levels, and mobility to the field is difficult, with no vehicles or even facility for hiring being made available to the staff. Some donors have provided some staff with motorcycles, which again have to be run by the individuals with no funds for fuel and maintenance. They also do not have facilities for testing soils, seeds, chemicals, fertilizers etc. There was one lab located in Jalalabad, set up with ICARDA and FAO support which caters to the needs of the whole of Eastern Afghanistan, clearly there is a need to set up more such facilities at district and sub-district level to cater to the needs of the farming community. The unemployed youth can be trained to run them and earn too.

There is also a big problem of coordination among different agencies which are doing some good work, but in an ad-hoc manner and with limited effect. One problem is that there are places where exists a security threat, and many international workers would not be very eager to work in those areas.

Presentation on market driven extension system before different stakeholders both at Balkh and Nangarhar provinces evoked good response from the various stakeholders (list appended). The response was generally warm, with participants asking about how this could be implemented in Afghanistan, and what support was needed for starting the PRA. In general, it was agreed that what worked in India may or may not work, but pilot testing in two districts from each Balkh and Nangarhar provinces would set the tone.

- **Assessment of Agricultural Universities**

Kabul University, Faculty of Agriculture (KUFA)

Dean of the Faculty, informed that KUFA was doing very little on Technology Transfer front, reason being that it was primarily not there mandate and also due to severe shortage of faculty members, who were too busy teaching, and could not be spared for extension work. However, if there was some sponsored programme, for which a specific request was made to his office, he would spare some staff for extension/ training work. Moreover, he informed that no university in Afghanistan was yet offering post graduate courses in the field of agriculture sciences, but there was a talk about starting PG courses in some departments in near future with support from countries like Japan, USA and India.

Balkh University Faculty of Agriculture (BUFA)

On the other hand, Dean, Faculty of Agriculture, Balkh University added that this is a good time as most farmers want some change in the way extension is being conducted in the country, and most of their problems are not being addressed by either research or extension establishments. He informed that water is a big concern, as water table is low and river level is down making access by farmers difficult. He emphasized need for more water and canals. PRA process was explained to him and Dean Ansari mentioned that students have been asked to identify problems suggesting this to be a possible supplement to the PRA. Ansari mentioned some of university needs of equipment, laboratories and water for the new farm. The Dean further discussed student projects including a study of pine germination. He also mentioned some research with Mazar Foods and desertification research. BUFA now has 650 students and a total of 17 faculty and staff. 3 faculties are presently in India.

The research farm, normally gets water every 12 days but not enough water this year, resulting in need to harvest onions prematurely. Crops were heavily infested with weeds. Mulberry growing along canals was cut for firewood and replanted yearly. Poplar is bought in the market. Advice on farming is received from the district extension agent but it is grossly inadequate.

- **Assessment of Other Agricultural Organizations**

Farmer owned Nangarhar Seed Company (owned by Nangarhar Seed Growers Federation) With technical help from ICARDA and FAO, seed production has started in a big way in this province. The company is owned by the farmers and some of the associations who are part of the company are known as Sharq, Koraniz, Israr, Canal Development Directorate, etc. While the Seed associations have been formed by farmers with facilitation from ICARDA, about 9 associations, have come together to form one Federation located at Jalalabad

The breeder and/or foundation seeds are provided by FAO and ICARDA at no cost, and they are grown under the close supervision of these organization. Quality control and special practice for seed production are taught by ICARDA scientists. There are processing facilities available with Sheeshambagh research farm and also elsewhere. Presently seeds of wheat, rice, mung bean, potato are being produced by the association members and germination and disease testing is done at research lab at Sheeshambagh.

Seeds are sold at local stores, and also through various Ag Fairs held in different provinces from time to time. The Federation has a large storage at Besood district. After production, Government and farmers members of Federation jointly fix the price for the seed. Last year's price was 850 USD per MT for new certified seeds and 800 for truthful seeds. Besides ICARDA, Foundation and breeders seed are also provided by MAIL. This producers company is registered with Ministry of Economy and Ministry of Agriculture. However, hybrid seeds are not being produced presently but there are plans to do so in near future. To support extension activities, FAO & ICARDA have provided one motorcycle to each district for extension works, but users have to bear the cost of fuel from their own pockets.

▪ **Private Sector Involvement**

Afghan Agro Service Company

Head of Afghan Agro Services Company, Kabul informed that his company works in three major areas namely, product marketing and extension services, research and development, and market development, in whole country. This is company which has most of its workers young and qualified and Mr. Khan himself a post graduate from Peshawar, Pakistan with most of his team members at least graduates. They teach basic agricultural skills to the farmers, like spraying and use of other farm equipments, safe use of machines and agro-chemicals, mulching, crop management practices, better use of agricultural technology to reduce loss of water are some of them.

The company is working in Mazar-e-sharif in north and also in some eastern provinces of Afghanistan; they provide testing facilities to the farmers and hire expertise from Pakistan as and when needed, to conduct their field trails, farmer's training and capacity building programmes. They conduct demonstrations to effectively communicate the superiority of new technology like seed, agro-chemicals etc. For demonstrations they use farmer's fields but ensure that in case of failure of the crop demonstration the farmer is fully compensated by the company.

Market development is another area where the company is active and it has recently started exploring the possibilities of tomato paste production and marketing from areas having surpluses, and in the process ensured that the farmers get a better deal in terms of prices and timely payments. The company is paying greater attention to cotton, melons and other cash crops, working in partnership with the government of Afghanistan.

Noor Agro Service Company

Some private sector companies like Noor Agro Seeds Company (NASC) which runs over 300 Rural Farm Stores in 119 villages located in 19 provinces through its channel partners. NASC is also a partner of Drukshaan Agro and Social Association (DASA), which is active in organizing farmers and linking them with markets, particularly the seed growers. These stores deal in various agro-inputs like seeds, fertilizers, plant protection chemicals, farm equipments. These Rural Farm Stores are also helping farmers with advisory services, like what to grow and how, and this has resulted into better business in terms of sale of inputs from these stores.

NASC, has a network of 450 farmers, who are producing seeds for the company under contract, the company on its part provides the breeders or foundation seeds and buys back

the foundation/certified seeds produced by these farmers at a premium price which is 10-15 % higher than the market prices. The sale price of the seeds sold by the company is also higher than the other competing players in the market, because of the goodwill earned by the company over years. The farmers are supported by inputs made available by the company on credit and the dues are adjusted at the time of purchase by the company. The Group is working closely with FAO to get germplasm of recommended varieties and multiplying through its farmer partners. The company also imports seeds of vegetables for countries like Holland, India, USA and after it has been validated by local researchers, it goes for its resale in Afghanistan

▪ **National and International NGOs**

Mercy Corps

Mercy Corps, an international NGO is working in four areas namely, Horticulture, Agricultural Infrastructure Development, Poultry Development, and Development of Agri-business. It is working in selected provinces namely Kandhar, Kundustakhab, in 5 clusters in north and 3 clusters in south. In horticulture sector project it is working in nursery, orchard establishment, and orchard development. In agricultural infrastructure project it works for irrigation infrastructure development, de-silting of canals and development of link roads to markets (now stopped).

Under the poultry project it was providing chicks to poor women for backyard poultry.

Under agri-business project it was doing market surveys, linking farmers to markets and mobilizing the communities through its Community Mobilizing teams, which explains the project to the communities; helps them select the appropriate project; and remains in close contact with them for successfully commissioning the project. It was also involved in Value Chain development for horticultural, and poultry products.

The Mercy Corps has developed about 200 Women's Groups for backyard poultry by providing 40 chicks to each member and helped them form Association which is successfully marketing the eggs and chicks. This association has duly elected office bearers, but due to cultural constraints, male counterparts are taken along for marketing the output. The women are trained by women master trainers, and help is provided on all technical issues to them.

Under horticulture development, saplings of fruit trees grown by the individual farmers are being marketed collectively through the association. MercyCorps has helped the farmers develop saplings by providing direct financial and technical support to them, the only precondition being that the farmers must own 1.5 zareeb of land and must be used for at least three years for developing the saplings of fruit trees. Financial support was provided to the participants of this programme by the NGO.

In the area of animal husbandry, vaccinations, testing for worms and diseases, and AI facilities have been established in rural areas, by MercyCorps. They have provided cash support to the tune of USD 15,000/- to each individual Village Field Unit (VFU) setup by Contractual workers drawn from among the local youth, initially these VFU were owned by the NGO, but gradually they are being transferred to the individuals who were running them after the initial cost was recovered. So far 11 such VFUs have been privatized and another 11 are expected to be privatized.

Livelihood Economic & Agricultural Development Organization (LEADO)

This organization has been working closely with international organizations like FAO, Church Aid (CCA), and USAID-ASMED. The area of operation was horticulture & livestock development, capacity building and market linkages of carpet weavers, training of Master Trainers for running Farm School.

LEADO is working for development of value chains and market linkages by organizing farmers and entrepreneurs into associations and so far developed 3 women's association in Herat and 3 farmers association in Gazani province, which are working in milk production, fruits production etc.. An association typically has 20-25 groups as its members and each group may have 4-8 persons/farmers as its members. In addition they have developed 3 women resource centers each in Herat and Gazani provinces. They have also trained about 200 extension workers in 10 provinces under Horticulture and Livestock Programme (HLP).

▪ Efforts to organize farmers and farm women into producer groups

Organizing Farmers

Some initiatives in organizing farmers were seen both in Balkh and Nangarhar provinces, where MAIL with help from international donors and NGOs had been able to organize farmers into groups and federations based on different commodities, e.g. Nursery growers Association in Balkh, Beekeeping Association and Federation, Seed Growers Association and HMAC Association in Nangarhar province formed with ICARDA support, however more such initiatives are needed at district and sub-district levels.

More specifically the NGO and private sector has been playing a greater role in organizing the farmers into producer companies, e.g. Noor Agro Group, which had organized its seed growers from which it makes assured purchases of certified seeds. Then there was Afghan Agro Company which was providing backward linkages to tomato growers, and also Mercy Corps, which helped organize women groups for backyard poultry.

▪ International Organizations, including CGIAR Centers

ICARDA, which has the CGIAR eco-regional mandate for Central and West Asia, including Afghanistan, is responsible for the overall management and coordination of Future Harvest Consortium to Rebuild Agriculture in Afghanistan (FHCRAA) activities, which will be implemented through a series of projects. ICARDA with funding from USAID and other donors, and in collaboration with other CGIAR centers (CIP, IRRI, CIMMYT) and partners (IFDC and AVRDC-World Vegetable Center) has an active ongoing program delivering:

- improved seed and fertilizer to farming communities
- community-based seed production and marketing enterprises within RAMP (USAID-Rebuilding Agricultural Markets Project) and ALPs (USAID Alternative Livelihoods Programs in Eastern and Northern Afghanistan)
- on-station and on-farm adaptive research programs

- technology transfer through more than 1600 crop demonstration plots in seven provinces of Afghanistan
- Extensive training and capacity building programs.

Before the conflict there were 19 agricultural stations in Afghanistan that produced and selected plant varieties according to the needs of different agro-climatic zones. Most of these stations were damaged during the conflicts, and materials and equipment were looted. Moreover, the trained personnel that staffed the stations dispersed, many leaving the country. Prior to 2002, crop improvement research was re-established by the agriculture section of the Swedish Committee for Afghanistan (SCA) in 1990 with UNDP and Swedish funding, which was later transferred to FAO. The planting material that was developed by this program was very useful and it is still in use by the farming community today. However, since these types of activities did not comprise emergency assistance, most of the donors withdrew their support to the respective NGOs (SCA, DACAAR, IRC, MC, MADERA, and FAO).

During 2002, through FHCRAA established with the financial assistance of USAID, some of the research stations were to some extent rehabilitated and some equipment provided. Germplasm was repatriated to Afghanistan, but unfortunately there is no gene bank in the country to maintain it. Lack of donor support for such activities has restricted what can be done in the past three years.

The CGIAR centers and other partners in FHCRAA are ready to share and have shared valuable semi-finished germplasm with MAAHF, but there is no systematic adaptive research and testing program currently running in the country. MAAHF's Agriculture Research Institute of Afghanistan (ARIA) is not actively conducting such research, because of lack of equipment and trained personnel.

Germplasm and semi-finished advanced lines of the different crop varieties are needed from international plant breeding programs for screening in-country for their adaptation under different agro-climatic conditions. The establishment of adaptive research programs, with the full involvement of ARIA, is needed to select and identify the best yielding varieties for release to the farmers. ARIA's staff needs both short and long term training, which can be provided both within country and outside at advanced research institutes, in order to build its capacity to continue such research programs on sustainable basis.

▪ **Assessment of Specific Agricultural Sector Constraints**

Water, Irrigation and related issues

Water emerged as the most critical issue for developing agriculture in Afghanistan (av. Rainfall 400mm/yr, last year 100mm only)), in both Balkh and Nangarhar provinces despite having some good sources of water were facing acute shortages, when it was needed most. For example in Balkh province, there are 11 canals in Mazar-e-sharif area (part of 18 canal system) which irrigate most parts of the province. A major complaint heard from most of the users of water through canal system in Balkh province was that upstream areas can use water as much and anytime they want and downstream/ tail areas have shortages. There is enough water for a single wheat crop still the downstream areas typically get water every 15-20 days, this problem is also seen in many south Asian

countries. The irrigation turn is linked to the area of land and not to the needs of the crop. Size of farm affects amount of water allocated. Overall 300,000 ha (10% of potential) has an engineered water supply.

Availability of reservoirs is limited and sedimentation is further limiting capacity. Jalalabad reservoir in Nangarhar province is nearly completely full of sediment and no reservoir in the North non-engineered areas tends to be more impacted during drought but engineered areas also subject to water loss. Farmers individually typically lack water storage capacity. A watershed program is planning for rehabilitation of overgrazed land and desertification. Including planting and check dams.

Director Generals of Agriculture department in both the provinces emphasized need for technical expertise to be provided by an irrigation or water specialist, presently lacking with them. They also said that lab and testing facilities are lacking for insect and disease identification along with inadequate human capacity. It was sensed that ministry feels threatened by more recently educated and better equipped individuals supported by NGOs who are posing a threat to the ministry at this level, with none other than the Director ARIA airing such views. Other problems identified were a lack of water, otherwise they would grow poppies. Also mentioned was the need for more fertilizer, loans and the lack of a market. There were some poultry production initiatives, in Nangarhar where on one farm with 23,000 birds were established, but most is imported from Pakistan. There was also a problem of vegetable storage and processing & value addition in the country. When asked about government action on water usage answer was that it is natural that people closer to water will use more water. Saw donated tractors and implements in compound originating from Belarus in office campus of Director General of Agriculture in Balkh.

Soils

Some basic information on soils obtained from the officials was, that soil's pH typically ranges between 8-8.5 and they are low in Phosphorus but calcium is abundant. Some work being done on urea briquettes and using sulfur to reduce soil pH. There is typically no rain from April to November. Regarding soil conservation, manure is saved for burning and wheat straw sold for construction, leaving very little residue and little opportunity for conservation tillage. It was also pointed that over grazing was removing the top cover of the soils making them prone to wind and water erosion in these provinces.

Natural Resources

MAIL is working directly with communities in planning for natural resources rehabilitation and maintenance of livelihood. A particular concern is removing remaining bushes for fuel. In southern Afghanistan forests are controlled by the communities with very little government control. However, there is a custom that if an individual cuts woods around a village, he must give something in return to the community, which a good practice, which needs to be supported.

In the north and west, the pistachio forests are regulated by the government but no active management is practiced. New laws are being drafted that transfer rights and responsibilities from government to communities, however there is still a very long way to go. Premature harvests remain a problem as there are no incentives to do otherwise.

The communities should be involved in the planning process, so that they have a sense of both ownership and responsibility to use the resources responsibly. In some cases, land allocation to specific villages is not clear. Many NGOs have experience in social aspects of community forestry but not much was evident at the grassroots level.

Food crop production system

Wheat is one of the most important crops both in Balkh and Nangarhar provinces, but there were problems of weed infestation in irrigated land. There are problems of Seed purity in wheat and water quality problems precluding drip irrigation. Lack of water availability and poor irrigation infrastructure, lack of certified seeds, fertilizers and other quality inputs, lack of transport infrastructure, spread of diseases/ insect pests, lack of market infrastructure, and severe shortage of office space and infrastructure (as much as only 6 out of 14 districts had any office space and the remaining 8 were being run from private buildings). Besides these problems lack of in-service training for the officers, and training to the farmers on new agricultural practices. Greater emphasis needs to be paid to the development of infrastructure, both at provincial and district level.

Some suggestions for improvement include improved water harvesting techniques at the farm level, check dams and vegetation cover and/or grazing control to protect check dams. Bank protection along rivers and canals and more emphasis on water tolerant plants such as pistachio and walnut is also needed urgently. There is a need for a national solidarity program focusing on social development. This includes the Afghanistan Conservation Corps. There are 12 trainers in Nuristan with plans forest protection and nursery establishment, forest road and bridge building. Other needs discussed included addressing ground water recharge and channelising rivers to get more land into production.

Horticulture production systems

It was mentioned by the some scientists interviewed that research was being done on fast growing poplars but strength problems remained in their use in construction work. Melons, raisins and almonds are imported to India and Pakistan. Sesame exported to Turkey, tomatoes are sold at Kabul. But there is an acute shortage of processing opportunities. JDA (an NGO) is working with an Afghan-American company to produce a container of sun-dried tomatoes for the open market. Back-up plan is to sell it to Turkey. Pistachio is being replanted from native genotypes that had been exported to other countries

Other constraints

There is a big problem of coordination among different agencies which are doing some good work, but in an ad-hoc manner and with limited effect. One problem is that there are places where exists a security threat and many international workers would not be very eager to work in those areas. Besides some other problems include: lack of a qualified people like soil scientist, pathologist, nematologist, entomologist, pesticide control, weather data and soils lab; need for “adaptive research” as universities have dictated practices without actual research to back it up and some interests include further work with saffron-alfalfa intercropping (cut and carry) and drip irrigation.

Problem of Quality Institutions

There is serious shortage of good institutions who can train people and farmers about new technology, HVC, mechanization, use of farm machines etc. The Faculty of Agriculture in Balkh, Nangarhar and Kabul where I visited and interacted with the Dean's concerned; all lamented the shortage of funds, poor infrastructure, inadequate number and quality of faculty members. As such academic institutions are in the most need of reforms, with new curricula, modern labs, with qualified teachers are urgently needed for the development of good research and extension network, because only better qualified persons can understand and work for the development of agricultural sector in this country.

Summary of Institutional Constraints, as perceived by stakeholders

1. Afghanistan is a different country with different set of problems, mainly water availability which is one of the most scarce resource in most parts of the country
2. Lack of quality control measures no facilities are available here to check the quality of fertilizers, seeds, agro and plant protection chemicals, leading to sale of substandard inputs sold in the markets, causing serious damage to the country's agriculture.
3. The public MAIL system appears to be too bureaucratic—operational procedures are both complex and time consuming, leading to corrupt practices.
4. The security situation is bad—leading to insecurity among the extension and research workers both from public as well as private sector.
5. Lack of government support—the private sector feels that the support from the government for development of agricultural sector in general is not in place. This puts added burden on the private sector involved, in input supply as well as setting up of food processing industries in the country. The sector has by and large been left to fend for itself, and this has led to poor growth in the agricultural sector, with very few daring to enter and sustain in long run.
6. Lack of market infrastructure
7. Severe shortage of qualified and trained manpower in all MAIL departments, but especially in extension.
8. Lack of storage and value addition facilities
9. ICT can play an important role in building the capacity of the farmers and extension personnel but no initiatives so far
10. Farmers are willing and eager to learn but appropriate capacity is not in place. The Ministry of Agriculture, Irrigation and Livestock (MAIL) and the Agriculture Faculties of various universities have little budget, manpower and desire to look beyond.
11. The private sector still being viewed as profit monger; therefore, partnerships with government departments are not forthcoming.

12. Almost all agricultural research in the country is funded by the external donors, little or no budgetary support from Govt.
13. Irrigation facilities are very poor almost non-existent
14. Lack of availability of quality inputs like certified seed, quality agro-chemicals.
15. Poor mechanization of agricultural sector.
16. Extension agencies lack trained staff and no effort to build the capacity of the Agricultural Technology System.
17. Agricultural infrastructure, like roads, market yards, office space, training and storage facilities have been badly damaged or are non-existent in most of the country and needs immediate support. For example, out of 14 districts in Balkh province, only 6 have proper office facilities and the remaining 8 districts there are no permanent office facility for the staff to work.
18. The number of people dependent on agriculture shows a sharp increase, before war about 80-85% population depended on agriculture, this has now gone up to 90-95%, due to lack of any alternate vocation like industries etc.
19. No provision for In-service training or capacity building of the officers of government departments engaged in the technology transfer and advisory services.
20. Though some training courses and field days are being conducted for farmers with the NGO or donor support, there are far too few extension activities of this type to have any significant impact of the agricultural sector.
21. Severe shortage of operating resources at provincial and district levels, making it very difficult to provide extension and training services to farmers.
22. There has been a constant decline in the number of technically qualified staff with the govt. departments. e.g. before war there were 1430 employees working with department of Agriculture in Balkh province, the number has come down to 342 employees, out of which only 200 are professionally qualified to provide advisory services to the farmers. Even among the so called qualified staff only 70 were Agriculture Graduates, and only 3 had post graduate qualifications, while the remaining ones had post-secondary level agricultural training.

▪ **Scope for a More Market-Driven Extension System**

Presentation on market driven extension system before different stakeholders both at Balkh and Nangarhar provinces evoked good response from the various stakeholders (list appended). The response was generally warm, with participants asking about how this could be implemented in Afghanistan, and what support was needed for starting the PRA. In general, it was agreed that what worked in India may or may not work, but pilot testing in two districts from each Balkh and Nangarhar provinces would set the tone.

It is therefore felt that the market driven extension model, which was pilot-tested in India could be tried on a pilot basis in two districts each of Balkh and Nangarhar provinces where the following strategy would be followed:

▪ **Recommended Strategy for Strengthening Agricultural Extension System**

A. **Goal:**

To improve the livelihoods of rural households and communities in selected provinces and districts within Afghanistan by making more productive use of surface- and ground-water resources by helping farmers 1) diversify their farming systems through the use of high-value, water-efficient crop and livestock systems; and 2) learn how to use more sustainable land and water management practices within different ecosystems in each district.

B. **Purpose.**

To pilot-test a sustainable and integrated water and land management strategy in selected districts and provinces that will introduce or expand the use of high-value, water-efficient crop and livestock systems to increase farm household income. Where these new agricultural innovations or value-added systems are proven to be effective, then the next step will be to scale-up these innovations to other producer/farmer groups within the current and/or other comparable agro-ecological zones/districts within the country. An additional purpose will be to organize farmer, producer, community and/or self-help groups (especially for rural women) at the community level so they can learn procedures for marketing specific high-value crops and products, as well as in managing their water resources at the community level.

C. **Approach and Suggested Plan of Work**

The following section outlines the approach being recommended that was successfully pilot-tested in India (1998-2004) and that is now being scaled up to all rural districts in India:

- I. **Training the Field Extension Staff** (October 2008). In the selected district(s) in each province, to train the district extension workers how to conduct a Participatory Rural Appraisal (PRA) and then develop a Strategic Research and Extension Plan (SREP) for their respective district. After orienting the national and provincial extension officials about this proposed approach (this should be done during August 2008), to train key members of the provincial and district extension staff how to conducting a PRA and then develop a SREP that will identify key constraints and potential market opportunities that can increase farm household income for different types of farm households within each agro-ecological zone.
- II. **Conducting the PRA** (October-November, 2008). With project assistance (covering travel expenses), the local extension staff in each district will carry out the PRA to identify important water and land resource problems that are confronting the different categories of farmers within the different agro-ecological zones of each district, as well as to identify innovative farmers and other market opportunities that might be pursued in developing value-chains for potential high-value (HV) crop and livestock products.

Time required for training the Field Extension Staff for PRA training for SREP preparation (This may be done in the months of October/November 2008)

Week-1- Training of Field Extension Staff in Balkh province

Week-2- Training of Field Extension Staff in Nangarhar province

Week 3: Return to the Balkh province for interaction with the field extension staff in determining key constraints and possible innovative farmers that may be scaled up. Once they have completed visiting all key agro-ecological zones in respective district, to discuss how these findings should be transformed into a SREP.

Week 4: Repeating this analysis and synthesis process in the Nangarhar province

Week 5: Return to Kabul and summarize the preliminary findings with the MAIL extension leadership and the NMSU project team to begin preparing for likely interventions.

- III. **Developing a SREP for each District** (December, 2008 through February 2009).
The findings from the PRA will then be translated in specific research and extension priorities as part of the SREP, including potential HV crop or livestock systems that may be suitable for different types of farm households in each agro-ecosystem of the district. The results of this SREP will become the primary focus of extension program activities to be pursued during the 2009 growing season.
- IV. It should be noted that the analysis of different value-chains within each district will be an integral part of developing the SREP. Particular emphasis will be given to “success stories” that are identified during the PRA, where different HV crops/products are already being produced by innovative farmers and then supplied to specific markets on a limited scale. The task will be to identify potential opportunities where specific HV crop or livestock systems can be scaled-up to a sizeable number of additional farm households within a community or district. It should be noted that these success stories are the direct result of entrepreneurial farmers who have already identified specific markets, worked out the necessary production procedures, as well as determined the most efficient way of marketing these products. The task of each extension team will be to assess each success story to determine whether this farmer is merely supplying a small niche market or whether there is real potential to expand the production and marketing of this crop or product by organizing farmers into producer groups. The resulting SREP will establish specific research and extension priorities for water-efficient HV crops/products that can be field tested or disseminated within each agro-ecological area during both the 2009 and 2010 growing seasons.
- V. **Organizing farmers and rural women, who are interested in producing and marketing water efficient, HV crops/products into Community or Producer Groups (C/PGs)** (December 2008 through the end of the project). It should be noted that different groups of farmers have different resources, interests and capacity to manage or tolerate risk. In organizing these different C/PGs, each of these factors must be taken into account, including group and gender dynamics. Different groups of farmers and farm women will be interested in pursuing different HV crops, livestock or other value-added enterprises. As a result, it is likely that many different F/PGs will be organized within each agro-ecological zone or district, depending on the interests and resources of these different groups of farmers and rural women. The field extension staff, possibly in collaboration

with an NGO in each district, will organize these different categories of farmers and farm women into different types of commodity or product-based groups.

The farmers and extension workers from the pilot districts may be taken for training and/or an exposure visit to selected private sector firms and NGOs to understand how a market-oriented value chain operates (e.g. Afghan Agro-Service, and Noor Agro Group) and how to organize farmers into groups (e.g. Drukshaan Agro and Economic Association, Mercy Corps and LEADO). This would enable both the farmers and extension workers to learn from the experience of these organization.

- VI. **Field testing, fine-tuning and/or disseminating water-efficient, high-value crop or livestock production systems to different C/PGs through on-farm trials and demonstrations** (both the 2009 and 2010 growing seasons). As more detailed information is gathered on specific markets for different HV crops/products, and as the interests of different F/PGs become known within each district, the provincial and district extension team will set priorities for field-testing these different crop and livestock systems for the coming growing season. In setting these priorities, the district teams will consult with provincial and national research and extension personnel, the AWATT team, and other knowledgeable institutions, such as the local ICARDA staff. The project will provide the necessary resources (seed, fertilizer, chicks, fingerlings, etc.) to introduce these potential HV crops/products within each community. The point of these on-farm trials and demonstrations is to rapidly field-test, validated and disseminate these different HV production systems under local growing conditions and in supplying nearby markets for these different products.
- VII. As needed, researchers from the MAIL and/or the private sector will be consulted to assess the feasibility of pursuing a particular HV crop or product. If such a HV crop or enterprise appears feasible within the watershed or district, then the local extension staff will need to be trained in how to organize farmers into producer groups and then to move forward in linking these F/PGs to promising markets. Finally it will be necessary to identify several high-value crops/products within each target that are suitable for different types of farm conditions to bring about crop and livestock diversification. This approach will mitigate risk by not saturating the market with one or two products, thereby, driving down prices.
- VIII. **Preparing to Scale-up Specific Enterprises** (June-August 2009). Conducting exposure visits or “farmer-to-farmer extension” for new groups of interested farmers and farm women is a particularly effective way in creating awareness and providing interested farmers with direct access to information about different high-value crops, products or enterprises. Also, consulting with an innovative farmer, who is already producing a particular HV crop/product, is an effective way of informing new F/PGs about the requisite production and post-harvest technologies, as well as alerting them to possible risks or problems that might be associated with specific enterprises. This information may then be shared these F/PG leaders and with other F/PG members to facilitate the development of a particular HV crop or enterprise within these new F/PGs.

- IX. **Conducting targeted training for new F/PGs.** Once a particular F/PG has decided to pursue a particular HV crop/product, then they will need to learn how to produce and market this crop or product. The frontline extension staff within each district will be directly responsible for organizing these training courses for each F/PG, as well as in providing technical assistance for these F/PGs during the growing season. These extension staff will contact extension specialists or researchers who can take the lead in organizing these training courses and the project will cover the necessary training costs. Specialists may be brought in from the national level or from other provinces to strengthen farmer knowledge and skills, so they can successfully pursue these new enterprises. In some cases, they might also involve technical specialists from the buying firm or involve successful entrepreneurial farmers who can serve as “farmer professors” in sharing their knowledge and experience with these new F/PGs.
- X. **Facilitating the delivery of production inputs as specific enterprises are scaled-up** (February and March during years 2- 3). At the inception phase (year one and two) technical assistance will be given to the F/PGs to help them learn how to secure the necessary production inputs, such as specific seed varieties that may be required to produce a specific crop/product to specification. Buyers (especially exporters) will be encouraged to provide the correct seeds and then deduct this seed cost at the time the product is delivered and sold to the buyer. Also, the participating research institutions may aid in seed multiplication or in the provision of planting material, and then sell these inputs to F/PG members. However, once the F/PG is successfully producing a specific crop or product, they will be expected to take over responsibility for securing the necessary seed and other production inputs.
- XI. **Producing crops/products to market specification.** F/PG members may need regular supervision and technical support from the frontline extension staff to ensure that specific crops or products (especially for export) are produced to market specification. Where problems arise, the F/PG leader may need to contact the extension staff who will consult with researchers or others who specialize in producing these specific crops/products or someone from the buyer’s technical staff may be consulted. Also, a specialist from the national research organization or ICARDA might be called in to assist, should the need arise.
- XII. **Harvest, process and/or deliver crop/product to market** (July-October). The marketing of different crops or products may vary from district to district, and from province to province. Members could be involved in contract production where the post-harvest handling and delivery of the product is highly specified. Alternatively, F/PG members may arrange for the transport, marketing and/or processing of the crop/product themselves. The emerging extension network in each district or province will take the lead in working out the specific post-harvest handling, processing and marketing procedures that may be needed for the different products to ensure maximum benefit to the F/PG members in terms of profit.
- XIII. **Empirically document that rural livelihoods in the target watershed have been improved** (March 2009 and December 2010). Analyzing the impact of this

project on farm incomes and rural households will be carried out as an integral part of two benchmark studies to be carried out within each target district. The first baseline study will be carried out in March 2009 at the beginning of the first production season for the project. This survey will include an in-depth analysis of different categories of rural households within different districts, including their human, physical, social and financial assets. By establishing this baseline data at the outset of the project will make it possible to assess the economic and social impact of this proposed approach in improving rural livelihoods. In conducting this baseline study, the previous experience of other similar projects within the region, such as in India, will be use in generating the necessary baseline indicators.

▪ **Steps to be followed in Preparing an SREP for each district**

- I. **Selection of pilot districts-** About 3-4 districts should be selected in each pilot province (i.e. Balkh and Nangarhar) for SREP preparation. While selecting these districts, it should be kept in mind that each district should be an accurate representation of the agricultural sector in that province.
- II. **Selection of a Project Director/ Project Coordinator-** next task would be to select a person from the Ministry of Agriculture/University who has sufficient experience and seniority, and entrust him the job of the Project Director in each of the selected province. This person would be the key person and would be responsible for all the activities listed below. He must have a fair amount of knowledge of English language and a research background would be an added advantage.
- III. **Selection of TOFA (Team of Farm Advisors)-** Field officers drawn from different departments like Agriculture, Animal Husbandry, Dairy, Fishery, Cooperative and scientists from the local research station and University, along with selected NGO representatives and progressive farmers will be oriented about the concept of participatory tools for preparation of SREP.
- IV. **Training the TOFA-** A training programme in which inductive methods of learning would be used and tools like brainstorming, group discussions and dummy exercises will be taken to make the participants very clear on the subject so that the SREP could be made more meaningful.
- V. **Selection of Agro Ecological Situations (AES)-**On the basis of important factors like topography, type of soil, water availability, annual rainfall/snowfall, vegetation and types of orchards/range lands/ field and horticultural crops grown, the sources of irrigation, different Agro-ecological Situations (AES) should be identified within the district for preparation of situation specific, farmers-demand oriented SREP.

Further, representative villages from each AES based on various agro-ecological factors will be identified. (If any village is found lacking in any particular enterprise the relevant information from adjoining village should be collected for carrying out SREP field exercises)
- VI. **Formation of Multi-disciplinary teams for each AES-** A team consisting of 5-6 members who should include one officer each from the major departments, one NGO representative active in that area, at least one scientist and one progressive farmer from that AES. These groups should be entrusted with collection of primary

information from the representative villages using PRA techniques and participatory methods for the preparation of SREP.

- VII. **Secondary information**-These will be collected by the officers of Govt. department using different government publications, progress reports, and also from the records of the District offices of Agriculture, Horticulture, Rural Development Department, Livestock & Animal Husbandry, Dairy, Forestry, Cooperative Departments, Leading Bank in that area District Statistical Office, NIC, and office of the Ministry of Agriculture, Irrigation and Livestock in the province.
- VIII. **Collection of primary information**-Field exercises were conducted in the selected representative villages of each AES of each district where members of the multi-disciplinary team will identify issues, collect data and information using participatory methods. The team should spend a total of seven days in the villages in two phases (4 + 3 days) and judiciously use the participatory tools for the collection of field data. The primary data collected during field practical will then be checked with various groups in the villages through triangulation as well as verified with other sources like secondary data collected from the departments.
- IX. **Review, verification and sharing of data** - All AES teams should adopt a procedure to present the data/information collected by them to the villagers in the village before coming out from the village for final consolidation and sharing of information with the villagers. The collected data should then be summarized and presented by each AES team in presence of senior level officers and scientists from all concerning departments, district heads of all departments, and farmers representatives from each selected village. Some of the AES teams may need to again visit the villages for rechecking the data and complete the missing links.
- X. **Developing activity schedule by the District Core team**-While strategies are long-term in nature, activities are systematic steps to achieve these strategies. On going departmental activities should be dovetailed and the missing links are to be supported by the Project. Each Strategy has to be translated into a set of activities, which will clearly spell out the size of unit, total units required, cost per unit and total cost in respect of each activity.
- XI. **Approval of SREP**-After thorough scrutiny by the Team of Officers and Scientists and farmer, the SREP should be presented for approval as authenticated plan document. This document will form the basis for agricultural development in the district.
- XII. **Preparation and Implementation of Action Plans**-Keeping in view the strategic thrust in SREP, annual / seasonal block action plans are prepared by TOFA to facilitate technology dissemination using innovative process like exposure visits, trainings both technological and managerial, demonstrations, field days, IT support etc. through the farmer groups. Simultaneously a research action plan consisting of on-farm trials is prepared and carried out in support of the research strategies spelt out in SREP by the Scientists of ZRS and KVK to assess and refine the existing generalized technologies.

- XIII. Re-Visiting of Strategies-** SREP development is a dynamic process, the issues emerged during course of implementation in coming days and suggested by the the various stakeholders viz. members of AGB/BTT/FAC/FOs were included from time to time and efforts were made to address them through Block Action Plan(BAP). Hence, necessary steps were initiated to revise and redress the SREP in light of the challenges and issues coming across during implementation of Block Action Plan in the future.
- XIV. Information and Communication Support-**A conscious effort has been promulgated to promote information and communication support to the farming community to keep abreast of latest developments regarding weather, market intelligentsia, and package of practices and sharing of success stories. Hand on trainings on computer application is being provided to the extension functionaries and farmer representatives through ATMA information kiosks at block level Farm Information and Advisory Centres (FIAC).
- XV. Success Story-**Implementing the action plan in consonance with SREP have generated “Centre/s of excellence” among farmer groups and innovative farmers. With support of relevant technologies, inputs and markets; this epoch making initiatives in the NATP pilot districts in India have brought about a sea change in working pattern and attitude of farming community, who are able to enhance their farm income with diversification and intensification of farming system. The cascading effect of such innovations would go a long way in replicating the same among other farmers.

Probable Timeline for completing the SREP in each district

Task	Likely duration*
Orientation of District Team	3 days
Identification of Agro-eco-situations (AES) within the district	3 days
Training of AES Teams	7 days
Data collection through participatory approaches	15 days
Data analysis, identification and prioritization of research and extension issues	15 days
Developing strategies for research and extension issues in the district	5 days
Developing activity schedule	5 days
Approval and acceptance of SREP	2 days
Total time required to develop SREP	55 days

* Depending on the local factors and situation on the ground, the time may increase/decrease

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